

# Notice of Allowability

Application No.

10/634,997

Examiner

Henry S. Hu

Applicant(s)

SUMIDA ET AL.

Art Unit

1713

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of March 21, 2006.
2. ☒ The allowed claim(s) is/are 2,5,7,9,12 and 17-21.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### DETAILED ACTION

1. This Office Action is in response to **two Amendments** filed on March 21, 2006, and February 27, 2006, respectively. **Claim 2 was amended; non-elected Claims 1, 3-4, 6, 8, 10-11 and 13-16 (Groups I and III) were all cancelled, while new Claims 17-21 were added.**

To be more specific, parent Claim 2 is only amended to remove the indefinite language as pointed out by the Examiner in 112-2<sup>nd</sup> claim rejection. The Applicants allege that support for claim addition and amendment can be found on page 10 of Remarks.

2. The Applicants have also corrected the same above indefinite problem on pages 2-3 in addition to the improper language of “oximsulfonate” on page 18 in specification. The examiner thereby withdraws specification objection and 112-2<sup>nd</sup> claim rejection in the previous Office Action dated August 25, 2005. **Claims 2, 5, 7, 9, 12 and 17-21 are now pending with three independent claims (Claim 2, Claim 5 and Claim 17).** An action follows.

3. Claim rejections under Non-Final Office Action filed on August 25, 2005 are now removed for the reasons given in paragraphs 4-11 thereafter.

### *Allowable Subject Matter*

4. Claims 2, 5, 7, 9, 12 and 17-21 are allowed.

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5. The following is an examiner's statement of reasons for allowance: The above Claims 2, 5, 7, 9, 12 and 17-21 are allowed over the closest references:

6. The limitation of parent **Claim 2** in present invention relates to a fluorine-containing compound having a specific formula (2), wherein  $R^1$ ,  $R^2$ ,  $R^3$ , and  $l$ ,  $m$ ,  $n$  are as specified while  $l$  is 0-2 and  $o$  is 1-8. Parent **Claim 5** is related to a compound from Claim 2 when  $l$  is 0 and  $o$  is 4 with a specific formula (5). See other limitations of dependent **Claims 7, 9 and 12**. Newly added parent **Claim 17** is related to a fluorinated one-ring compound of Claim 2 or Claim 5 but with specific position for each substituent on the ring.

7. Applicant has claimed now in parent **Claim 2** an unexpected way of obtaining a fluorine-containing saturated-ring (cycloaliphatic) compound having a specific formula (2), wherein  $R^1$ ,  $R^2$ ,  $R^3$ , and  $l$ ,  $m$ ,  $n$  are as specified while  $l$  is 0-2 and  $o$  is 1-8. The key point is that such type of cyclic compounds is "aliphatic" and not aromatic at all in nature. Parent **Claim 5** is related to a one-ring compound from Claim 2 when  $l$  is 0 and  $o$  is 4 with a specific formula (5), while newly added parent **Claim 17** is related to a fluorinated compound of Claim 2 or Claim 5 but with specific position required for each substituent and on only one ring.

As discussed earlier in 103 rejection, the primary reference **Farah** may have disclosed that condensation of hexafluoroacetone with various mono-phenol (such as phenol and 1-naphthol) and dihydric phenol (such as 1,5-naphthalenediol) in the presence of some

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**catalyst such as toluenesulfonic acid may result in the attachment of at least one 2-hydroxyhexafluoro-2-propyl moiety onto the aromatic rings, particularly phenol-type rings is included in this category (page 1003, abstract and introduction, in: Journal of Organic Chemistry, 30(4), 1003-1005, (1965)).** However, Farah is still silent about the preparation of the hydrogenated (or called cycloaliphatic) analogue.

8. In a very close examination, secondary reference **Hatakeyama** may teach that in the course of making fluoropolymers having **2-hydroxyhexafluoro-2-propyl** moiety, cycloaliphatic structure and aromatic structure in the polymers are found to be functional equivalent and interchangeable. The advantage is that a resist composition sensitive to radiation below 200 nm wavelength for photo-lithographic microprocessing can be obtained (abstract, line 5-8). However, **Hatakeyama's system is only be applied to regular aromatic rings when it is without any hydroxyl group directly attaching on the ring.** Therefore, Hatakeyama does not disclose or suggest such a cycloaliphatic modification on the phenol-type ring. **In summary, a motivation to link Farah with Hatakeyama is missing.**

With respect to the tertiary reference used in other 103 rejection for dependent Claim 9, **Fedynyshyn** may teach in making fluoropolymers having **2-hydroxyhexafluoro-2-propyl** moiety (paragraph 0050), **compatible copolymerizing units related to the class of vinyl, acrylate, methacrylate and trifluoromethacrylate** are each other found to be functional equivalent and interchangeable (paragraph 0053). The advantage is that a resist composition

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very sensitive to **radiation at 157 nm** can be obtained for photo-lithographic microprocessing (abstract, line 1-4). Again, Fedynyshyn cannot fix the deficiency of Farah/Hatakeyama.

9. It is noted by this Examiner that phenol-type compound is at least somewhat different from benzene-type compound although both compounds are aromatic in nature. For instance, they are quite different in many areas including electrophilic aromatic substitution, nucleophilic aromatic substitution and many other factors such as chemical reactivity. **Having made an aromatic derivative does not necessarily achieve the availability to make a phenol-type derivative with exactly the same condition.**

Additionally, the present invention has already shown **unexpected results** in examples along with some comparative examples for making such a cycloaliphatic compound with such a combination of substituents (see pages 19-38 for **examples 1-28** with control examples). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

10. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

**US Patent No. 6,136,499 to Goodall et al.** only discloses the preparation of photoresist compositions comprising **polycyclic polymers with acid-labile pendant groups** (title and abstract). In a close examination on the acid-labile polycyclic monomers used by Goodall, **only**

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**norborene type structure is involved** (column 5, line 33 – column 6, line 52). No phenol-type derivative is disclosed or suggested. Therefore, Goodall fails to teach or fairly suggest the chemical structure limitation of Claims 2, 5 and 17 in present invention.

**USPG-PUB 2003/0099901 A1 to Hatakeyama et al.** only discloses the preparation of photoresist compositions (useful for patterning) comprising **polymers with acid-labile pendant groups** (title and abstract). In a close examination, only monomers with regular aromatic rings are used or suggested by Hatakeyama (pages 4-7). No phenol-type derivative is disclosed or suggested. Therefore, Hatakeyama fails to teach or fairly suggest the chemical structure limitation of Claims 2, 5 and 17 in present invention.

11. The key issue on making fluorinated phenol-type cycloaliphatic derivative with formula (2) or (5), cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

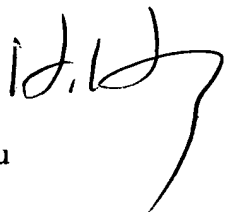
12. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the three independent and parent **Claims 2, 5 and 17** are allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 7, 9, 12 and 18-21** are passed to issue.

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13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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May 22, 2006



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